

INCH-POUND

NOTE: The document identifier and heading has been changed on this page to reflect that this is a performance specification. There are no other changes to this document. The document identifier on subsequent pages has not been changed, but will be changed the next time this document is revised.

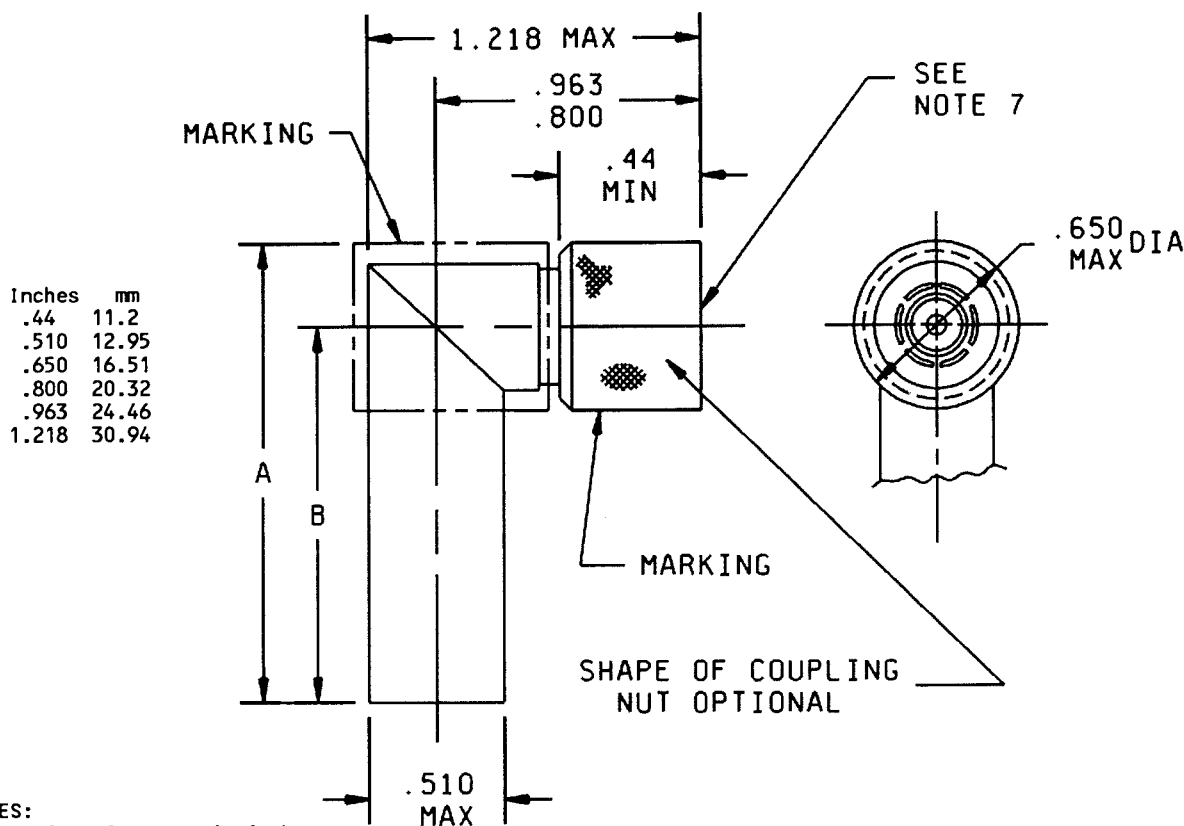
MIL-PRF-39012/30G  
26 September 1994  
SUPERSEDING  
MIL-C-39012/30F  
3 October 1986

# PERFORMANCE SPECIFICATION SHEET

CONNECTORS, RECEPTACLE, ELECTRICAL, COAXIAL, RADIO FREQUENCY  
(SERIES TNC (CABLED), PIN CONTACT, RIGHT ANGLE, CLASS 2)

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist of this specification sheet and the issue of the following specification listed in that issue of the Department of Defense Index of Specifications and Standards (DODISS) specified in the solicitation: MIL-PRF-39012.



## NOTES:

1. Dimensions are in inches.
2. For dimensions A and B, see tables I and III.
3. Metric equivalents are given for information only.
4. Wrench flats are to accommodate standard wrench opening in accordance with FED-STD-H28, appendix 10.
5. Dimension A defines the maximum length of the connector when assembled to the appropriate cable.
6. All undimensioned pictorial representations are for reference purposes only.
7. Series TNC, pin contact interface in accordance with MIL-STD-348.
8. Three holes .027 (0.69 mm) minimum diameter equally spaced for safety wiring. Location on the coupling nut is optional.

FIGURE 1. General configuration.

AMSC N/A

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FSC 5935

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

TABLE I. Dash numbers, cross-reference, and dimensions.

Dash number <u>1/</u>	Applicable cable M17/ <u>2/</u>	Dimensions	Inches (millimeters) maximum
Category A - Field serviceable (no special tools required) <u>3/</u>			
0101 (Superseding -0104 <u>4/</u> ) Cable grouping VI	28-RG058 155-00001 183-00001 197-00001 111-RG303 170-00001 60-RG142 <u>5/</u> 158-00001 84-RG223 167-00001 194-00001 200-00001 128-RG400 <u>6/</u> 175-00001	A	1.750 (44.45)
0102 (Superseding -0117 <u>4/</u> ) Cable grouping VII	29-RG59 <u>7/</u> 184-00001 <u>7/</u> 110-RG302 <u>5/ 6/ 7/</u> 30-RG062 <u>7/</u> 185-00001 <u>7/</u> 97-RG210 <u>7/</u> 90-RG71 <u>7/</u> 195-00001 <u>7/</u>		
0103 Cable grouping IV	54-RG122 <u>6/</u> 157-00001 187-00001 198-00001		
0118 Cable grouping II	113-RG316 <u>5/ 6/</u> 119-RG174 173-00001 196-00001 172-00001 94-RG179 <u>7/</u>		
0225 Cable grouping X	74-RG213 6-RG11 <u>7/</u> 181-00001 <u>7/</u> 62-RG144 <u>7/</u> 65-RG165 159-00001 189-00001 163-00001 75-RG214 190-00001 164-00001 86-00001 127-RG393 <u>5/ 6/</u> 174-00001 77-RG216 <u>7/</u> 191-00001 <u>7/</u>		

See footnotes at end of table.

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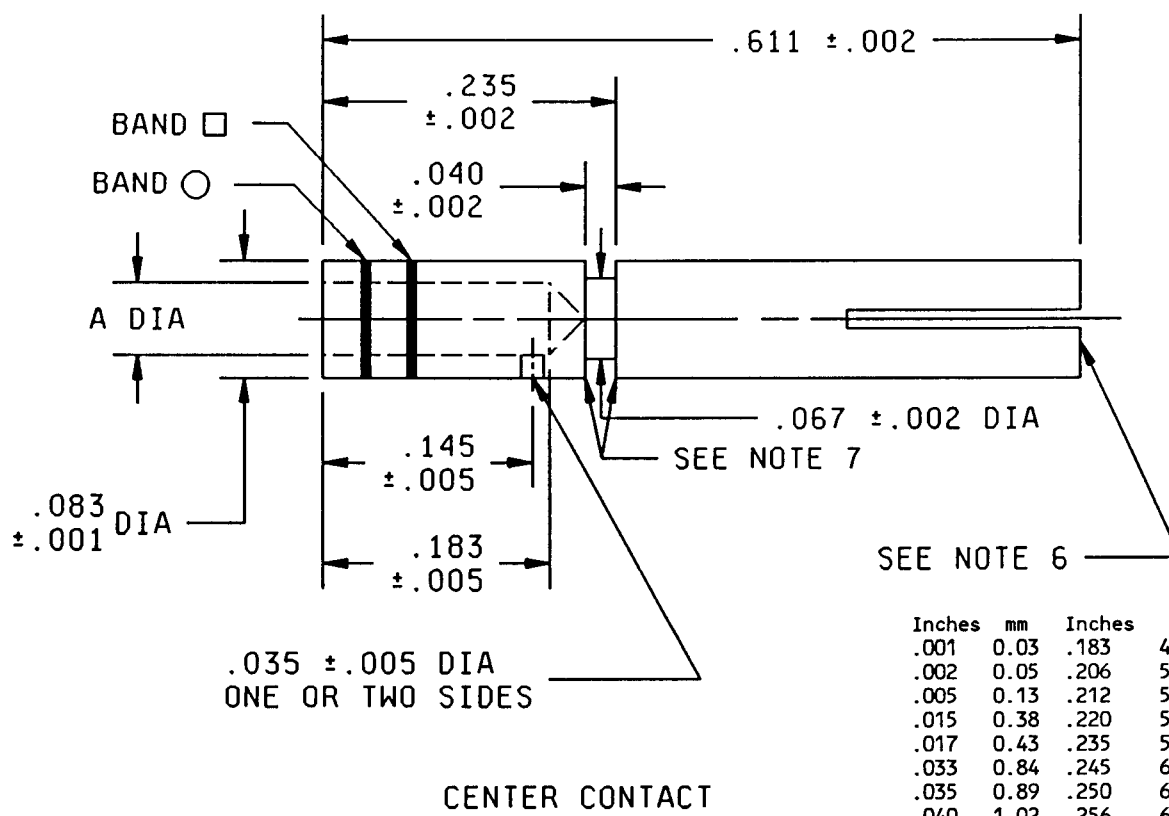
TABLE I. Dash numbers, cross-reference, and dimensions - Continued.

Dash number <u>1/</u>	Applicable cable <u>2/</u> M17/	Dimensions	Inches (millimeters) maximum
Category C - Field replaceable (MIL-C-22520 crimp tool) See footnote next to applicable cable for crimp die <u>3/ 8/</u>			
0010 Cable grouping VIA	28-RG058 <u>9/</u> 155-00001 <u>9/</u> 183-00001 <u>9/</u> 197-00001 <u>9/</u> 111-RG303 <u>5/ 6/ 9/</u> 170-00001 <u>9/</u>	A	2.000 (50.80)
0011 Cable grouping VIB	84-RG223 <u>9/</u> 60-RG142 <u>5/ 9/</u> 158-00001 <u>9/</u> 167-00001 <u>9/</u> 194-00001 <u>9/</u> 200-00001 <u>9/</u> 128-RG400 <u>6/ 9/</u> 175-00001 <u>9/</u>		
0012 (Superseding -0021 <u>4/</u> ) VIAA	29-RG59 <u>7/ 10/</u> 184-00001 <u>7/ 10/</u> 110-RG302 <u>5/ 6/ 7/ 10/</u> 30-RG062 <u>7/ 10/</u> 185-00001 <u>7/ 10/</u> 97-RG210 <u>7/ 10/</u>		
0013 Cable grouping IV	54-RG122 <u>6/ 11/</u> 157-00001 <u>11/</u> 187-00001 <u>11/</u> 198-00001 <u>11/</u>		
0014 Cable grouping VIIB	90-RG71 <u>6/ 7/ 10/</u> 195-00001 <u>7/ 10/</u>		
0022 Cable grouping IIA	113-RG316 <u>5/ 6/ 12/</u> 119-RG174 <u>12/</u> 173-00001 <u>12/</u> 196-00001 <u>12/</u> 172-00001 <u>12/</u>		
0023 Cable grouping V	95-RG180 <u>6/ 7/ 11/</u>		
Category D - Field replaceable - Defined piece part <u>3/ 8/ 13/ 14/</u>			
0501 Cable grouping IV	54-RG122 <u>6/</u> 157-00001 187-00001 198-0000	A B	1.859 (47.23) 1.468 (37.31)
0502 Cable grouping V	95-RG180 <u>5/ 6/ 7/</u>		
0503 Cable grouping VIB	60-RG142 <u>5/</u> 158-00001 84-RG223 167-00001 194-00001 200-00001 128-RG400 <u>6/</u> 175-00001		
0504 Cable grouping VIA	28-RG058 155-00001 183-00001 197-00001 111-RG303 <u>5/ 6/</u> 170-00001		

See footnotes at end of table.

TABLE I. Dash numbers, cross-reference, and dimensions - Continued.

- 1/ For cross-reference of dash number to superseded PIN or type designation, see table IV.
- 2/ The latest version of each cable shall be applicable.
- 3/ These connectors have captivated center contacts.
- 4/ The superseded PIN are acceptable for Government use until stock is purged or 3 years from the date of this specification which ever is earlier.
- 5/ Cable to be used for the +200°C temperature cycling tests.
- 6/ Cable to be used when performing tests requiring cable except as in 5/ and 7/.
- 7/ These are not 50-ohm cables; therefore, when attached to the specified connectors, VSWR, RF, leakage and insertion loss are not applicable.
- 8/ These connectors are assembled using the applicable crimp tool, to the specified cables stripped as shown on figure 4.
- 9/ M22520/5-19 closure B or M22520/5-05 closure A.  
M22520/5-11 closure A  
M22520/5-57 closure A
- 10/ M22520/5-19 closure A or M22520/5-07 closure A.  
M22520/5-13 closure A  
M22520/5-59 closure A
- 11/ M22520/5-41 closure B or M22520/5-05 closure B.  
M22520/5-09 closure A
- 12/ M22520/5-35 closure B or M22520/5-03 closure A.
- 13/ Complete connector assembly shall consist of a body, center contact, ferrule and assembly instructions.
- 14/ Not to be used in Army equipment.



Inches	mm	Inches	mm
.001	0.03	.183	4.65
.002	0.05	.206	5.23
.005	0.13	.212	5.38
.015	0.38	.220	5.59
.017	0.43	.235	5.97
.033	0.84	.245	6.22
.035	0.89	.250	6.35
.040	1.02	.256	6.50
.043	1.09	.261	6.63
.067	1.70	.263	6.68
.083	2.11	.297	7.54
.145	3.68	.500	12.70
.175	4.45	.611	15.52

Dash no.	Contact no. 1/	A +.001 -.002	Basic crimp tool 2/	Crimp die or positioner	Crimp tensile min	Color band □	Color band ○
0501	30-12	.033	M22520/1-01	M22520/1-12	10 lbs	Orn	Violet
0502	30-11	.017			6 lbs	Blue	
0503	30-10	.043	M22520/1-01	M22520/1-12	20 lbs	Red	
0504							

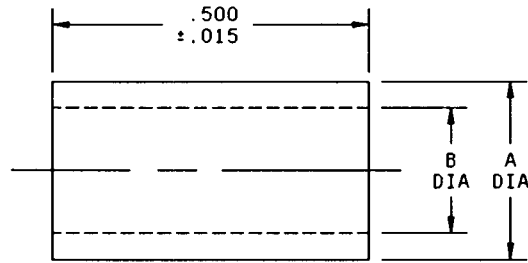
1/ Contact numbers and ferrule numbers are for identification only.

2/ Class 2 tool may be used by OEM (see MIL-C-22520).

#### NOTES:

- Dimensions are in inches.
- Metric equivalents are given for information only.
- Contact material shall be phosphor bronze or copper beryllium.
- Crimp tensile test shall be in accordance with MIL-C-39029.
- Copyright notice: All information disclosed in these specification sheets which is or may be copyright is reproduced herein with the express permission of the copyright owner.
- Form socket to mate with .052/.054 (1.32/1.37 mm) diameter and .195 (4.95 mm) depth pin.
- Maximum break of .003 inch (0.08 mm).
- Color bands shall be positioned so that no coloring material enters the inspection hole.

FIGURE 3. Contact and ferrule dimensions for category D only .

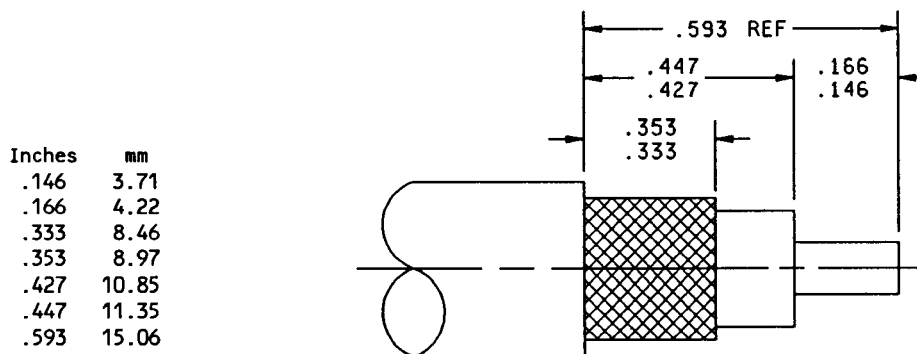
CRIMP FERRULE

Dash number	Ferrule number 1/	A ±.003	B ±.003	Basic crimp tool 2/	Crimp die or positioner M22520/5
0501 0502	30-50	.212	.175	M22520/5-01	05, 41 Closure B or 9 Closure A
0503	30-51	.250	.220		05, 11, 57 Closure A or 19 Closure B
0504	30-52	.245	.206		

1/ Contact numbers and ferrule numbers are for identification only.

2/ Class 2 tool may be used by OEM (see MIL-C-22520).

FIGURE 3. Contact and ferrule dimensions for category D only - Continued.



## NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.

FIGURE 4. Cable stripping dimensions for field replaceable connectors.

ENGINEERING DATA:

Nominal impedance: 50 ohms.

Frequency range: 0 to 11,000 MHz.

Voltage rating:

500 volts rms, maximum working voltage at sea level.

125 volts rms, maximum at 70,000 feet.

Temperature rating: -65°C to +165°C.

REQUIREMENTS:

Dimensions and configuration: See figure 1.

Force to engage and disengage:

Longitudinal force: Not applicable.

Torque: 2 inch-pounds, maximum.

Coupling proof torque: 15 inch-pounds, minimum.

Inspection conditions: Coupling torque: 4 to 6 inch-pounds.

Mating characteristics: See MIL-STD-348 and figure 2 for dimensions.

Outer contact:

Test ring ID: .319 maximum, 16 microinch finish.

Insertion force: 5 pounds maximum, when inserted a minimum of .093.

Contacts with slotted members: Shall contact a .324 minimum diameter ring within .031 of their tip ends.

Hermetic seal: Not applicable.

Leakage (pressurized connectors): Not applicable.

Insulation resistance: Method 302 of MIL-STD-202, test condition B. 5,000 megohms minimum.

Center contact retention: 6 pounds minimum axial force. Applicable to captivated-center-contact connectors only.

Corrosion (salt spray): Method 101 of MIL-STD-202, test condition B.

Voltage standing wave ratio (VSWR): From 500 to 11,000 MHz, or approximately 80 percent of upper cutoff frequency of the cable, whichever is lower; 1.30 maximum.

Swept frequency VSWR test setup:

Item 6 - VSWR shall be less than  $1.02 + .003 F$  (F in GHz).

Item 16 - VSWR shall be less than  $1.02 + .003 F$  (F in GHz).

Second step of VSWR checkout procedure - VSWR shall be less than  $1.06 + .007 F$  (F in GHz).

Group B inspection - VSWR shall be less than  $1.05 + .005 F$  (F in GHz).

Qualification and group C inspection - VSWR shall not exceed 1.10.

Connector durability: 500 cycles minimum at 12 cycles/minute maximum. The connector shall meet the mating characteristics and force to engage and disengage requirements.

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Contact resistance: In milliohms maximum:

	<u>Initial</u>	<u>After environment</u>
Center contact	2.0	2.5
Outer contact	.2	Not applicable
Braid to body	.1	Not applicable

Dielectric withstanding voltage: Method 301 of MIL-STD-202. 1,500 volts rms minimum at sea level.

Vibration, high frequency: Method 204 of MIL-STD-202, test condition B. No discontinuity permitted.

Shock: Method 213 of MIL-STD-202, test condition I. No discontinuity permitted.

Thermal shock : Method 107 of MIL-STD-202, test condition B, except test high temperature shall be +85°C. High temperature shall be +200°C for connectors using +200°C cables (see table I and III).

Moisture resistance: Method 106 of MIL-STD-202. No measurements at high humidity. Insulation resistance shall be at least 200 megohms within 5 minutes after removal from humidity.

Corona level:

Voltage: 375 volts rms, minimum.

Altitude: 70,000 feet.

RF high potential withstanding voltage:

Voltage and frequency: 1,000 volts rms tested at a frequency from 5 to 7.5 MHz.

Leakage current: Not applicable.

Cable retention force:

Noncrimp assemblies: 40 pounds minimum.

Crimp assemblies:

10 pounds minimum for cables .155-.189 OD.

20 pounds minimum for cables .190-.229 OD.

30 pounds minimum for cables .230-.249 OD.

40 pounds minimum for cables .250 OD and larger.

Coupling mechanism retention force: 100 pounds minimum.

RF leakage: -60 dB minimum, tested at a frequency between 2 and 3 GHz.

Insertion loss:

.21 dB maximum tested at 9 GHz.

$.07 \sqrt{F \text{ (GHz)}}$  dB max tested at 3 GHz and 6 GHz.

Part or Identifying Number (PIN): M39012/30- (dash number from table I or "B" number from table III).

Group qualification: See table II.



TABLE II. Group qualification. 1/

Group	Submission and qualification of 2/ any of the following connectors M39012/30	Qualifies the following connectors M39012/30
I	0101 0103 0104 0118	0101 0002 0103 0104 0117 0118
II	0102 0117	0102 0117
III	B0005 B0006 B0008 B0015 B0016 B0020	B0005 B0006 B0007 B0008 B0009 B0015 B0016 B0019 B0020
IV	B0007 B0009 B0019	B0007 B0009 B0019
V	0010 0011 0013 0022	0010 0011 0012 0013 0014 0021 0022
VI	0012 0014 0021	0012 0014 0021
VII	0501 0503 0504	0501 0502 0503 0504
VIII	0502	0502

- 1/ If a connector manufacturer produces a connector which meets all the requirements for two or more connector PIN's (within the same series), the manufacturer may receive qualification approval for two or more connector PIN's qualifying the one connector. It is not necessary that such connectors be in the same group. Each connector, however, must be marked with its own appropriate PIN. For group qualification, the connectors must be of similar design.
- 2/ For qualification retention, where more than one part is listed in a group in this column, data may be supplied on any of those parts in order to retain qualification for those parts in the corresponding right hand column. The part does not necessarily have to be the part initially qualified.

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TABLE III. CATEGORY B - NONFIELD REPLACEABLE (SPECIAL TOOLS MAY BE REQUIRED). 1/

NOT FOR AIR FORCE, ARMY OR NAVY USE. FOR OEM USE ONLY.

Part no. <u>2/</u> M39012/30B	Applicable cable <u>3/</u> M17/	Dimensions	Inches (millimeters) maximum
0005 <u>4/</u>	28-RG058 <u>5/</u>	A	2.000 (50.80)
0006 <u>4/</u>	60-RG142 <u>6/</u> <u>5/</u> 128-RG400		
0007 <u>4/</u>	29-RG59 <u>5/</u> <u>7/</u> 030-RG062 <u>7/</u> 97-RG210 <u>7/</u>		
0008 <u>4/</u>	54-RG122 <u>5/</u>		
0009 <u>4/</u>	90-RG71 <u>5/</u> <u>7/</u>		
0015 <u>4/</u>	111-RG303 <u>5/</u> <u>6/</u>		
0016 <u>4/</u>	84-RG223 <u>5/</u>		
0019 <u>4/</u>	110-RG302 <u>5/6/7/</u>		
0020 <u>4/</u>	113-RG316 <u>5/</u> <u>6/</u> 119-RG174		

1/ For maintenance replacements for category B, see table V.2/ For cross-reference of dash number to superseded PIN or type designation, see table IV.3/ The latest version of each cable shall be applicable.4/ Inactive for new design.5/ Cable to be used when performing tests requiring cable except as in 6/ and 7/.6/ Cable to be used for the +200°C temperature cycling tests.7/ These are not 50-ohm cables; therefore, when attached to the specified connectors, VSWR, RF leakage and insertion loss are not applicable.

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TABLE IV. Cross-reference of PIN's. 1/

Preferred PIN M39012/30	Substitute for PIN or type designation M39012/30-
-0101	0001
-0102	0002
-0103	0003
-0104	0004
-0117	0017
-0118	0018
B0005	0005
B0006	0006
B0007	0007
B0008	0008
B0009	0009
B0015	0015
B0016	0016
B0019	0019
B0020	0020

- 1/ The superseded PIN or the type designation is for cross-reference only. Where a superseded PIN or type designation is not given, none was assigned or will be assigned. The PIN M39012/30-XXXX shall be used in all cases for marking and identifying the connector.

TABLE V. Maintenance replacements for category B.

Category B no. 1/	Category C dash no.	Category A dash no.	Category D dash no.
B0005	0010	0101	0504
B0006	0011	0101	0503
B0007	0012	0102	---
B0008	0013	0103	0501
B0009	0014	0102	---
B0015	0010	0104	---
B0016	0011	0101	---
B0019	0021	0117	---
B0020	0022	0018	---

- 1/ Category B connectors are for original installation only. They will not be stocked or acquired by the Government.

Revision letters are not used to denote changes due to the extensiveness of the changes.

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CONCLUDING MATERIAL

Custodians:

Army - CR  
Navy - EC  
Air Force - 85  
NASA - NA

Preparing activity:

DLA - ES

(Project 5935-3932-20)

Review activities:

Army - AT, AV, CR, EA, MI  
Navy - AS, MC, OS, SH  
Air Force - 11, 19, 99